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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/680,549	10/07/2003	Kamal Jain	M1103.70141US00	5005

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EXAMINER	
AJIBADE AKONAI, OLUMIDE	
ART UNIT	PAPER NUMBER
2617	

DATE MAILED: 09/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/680,549	JAIN ET AL.
	Examiner	**Art Unit**
	Olumide T. Ajibade-Akonai	2617

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3 and 5-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3 and 5-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

1. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

DETAILED ACTION

Response to Arguments

2. Applicant's arguments with respect to claims 1-18 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-3, 5-8 and 13-18 are rejected under 35 U.S.C. 102(e) as being anticipated by **Chow (6,771,996)**.

Regarding **claims 1 and 18**, Chow discloses a method and computer readable medium containing computer-executable instructions (radio network planning tool, see col. 10, lines 29-34) performing the steps or method of modeling wireless interference among wireless links between a plurality of wireless nodes in a wireless network, the method or steps comprising: accepting connectivity information (node site information, see fig. 6, col. 20, lines 4-62) for the network (automated radio network planning tool receives information on existing links, indicating that it received the link or connectivity

from the plurality of node sites at the radio site locations, see fig. 2, col. 10, lines 29-41, col. 11, lines1-11); identifying wireless links (potential links, see col. 12, lines 44-58) between nodes (radio node sides, see figs. 3A-3C, col. 12, lines 44-52) of the network from the connectivity information (potential links are computed to connect the nodes in the network, see fig. 2, col. 11, lines 32-52); representing each identified link as a vertex (signal paths from first transmitter 405 to first receiver 410 and signal path from second transmitter 420 to second transmitter 415, see fig. 4A, col. 14; lines 55-67); creating an edge between a first vertex and a second vertex if the corresponding wireless links interfere with one another (interference path, see fig. 4A, col. 14, lines 55-67 and col. 15, lines 1-5), assigning to the edge a direction (interference path along the first receiver and second receivers 410 and 415, see col. 14, lines 55-67, col. 15, line 1); and assigning to the edge a weight equal to a fraction of a maximum permissible noise at a link corresponding to the second vertex contributed by activity on the link corresponding to the first vertex (links that can coexist without mutual interferences are designated with the number 1, see col. 13, lines 54-65).

Regarding **claim 2**, as applied to claim 1, Chow further discloses wherein the connectivity information (node site information, see fig. 6, col. 20, lines 4-62) is represented by a connectivity graph (see figs 5 and 6, col. 20, lines 44-62).

Regarding **claim 3**, as applied to claim 1, Chow further discloses assigning to the edge a weight of zero (0) if the links are not in conflict with each other (links interfering with other links are designated by the number 0, see col. 13, lines 61-61); and assigning to the edge a weight of one (1) if the links are in conflict with each other (links that can

coexist without mutual interferences are designated with the number 1, see col. 13, lines 54-65).

Regarding **claim 5**, as applied to claim 1, Chow further discloses wherein each node is equipped with exactly one radio (each node site is a radio site location, see col. 11, lines 1-10).

Regarding **claim 7**, as applied to claim 1, Chow further discloses wherein all nodes communicate on exactly one wireless channel (see fig. 3B, col. 14, lines 35-39).

Regarding **claim 8**, as applied to claim 1, Chow further discloses wherein each node may communicate on a plurality of wireless channels (10 different links or paths, see fig. 3A, col. 12, lines 44-53).

Regarding **claim 13**, as applied to claim 1, Chow further discloses wherein the wireless links have different capacities (mutually independent and mutually exclusive links, see col. 11, lines 53-64).

Regarding **claim 14**, as applied to claim 1, Chow further discloses wherein a receiving node must be free of interference for a transmission to be successful (radio links are selected to minimize interference between the radio links, therefore indicating that the links selected to join the nodes to each other have minimal interference, see col. 9, lines 47-67, col. 10, lines 1-19).

Regarding **claim 15**, as applied to claim 1, Chow further discloses wherein a sending node must be free of interference for a transmission to be successful (radio links are selected to minimize interference between the radio links, therefore indicating

that the links selected to join the nodes to each other have minimal interference, see col. 9, lines 47-67, col. 10, lines 1-19).

Regarding **claim 16**, as applied to claim 1, Chow further discloses making routing decisions based on created edges and vertices (all possible links with and without restrictions are identified and the RF planning tool selects the preferred links to provide communication utilizing parameters such as number of link hops between nodes and the switching center, average number of link hop between particular nodes, link distances and other criteria, see fig. 5, col. 27, lines 6-24).

Regarding **claim 17**, as applied to claim 1, Chow further discloses making network infrastructure decisions based on the created edge and vertices (the automated radio network planning tool provides ability to build out the communication network based on the analysis of existing, currently desired and future wireless links, see col. 10, lines 34-41).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Chow (6,771,996)** in view of **Hung et al 2005005811 (hereinafter Hung)**.

Regarding **claim 10**, as applied to claim 1, Chow discloses the claimed invention except wherein each node is equipped with a plurality of directional antennae.

In the same field of endeavor, Hung discloses a node (WLAN with smart antenna system, see fig. 3, p.2, [0021]) that is equipped with a plurality of directional antennae (smart antenna system of WLAN is composed of array antennas, see fig. 3, p.2, [0021]).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Hung with Chow for the benefit of increasing the number users in a WLAN system.

Regarding **claim 11**, as applied to claim 1, Chow discloses the claimed invention except wherein each node is equipped with a plurality of omni-directional antennae.

In the same field of endeavor, Hung discloses a node (WLAN with smart antenna system, see fig. 3, p.2, [0021]) that is equipped with a plurality of omni-directional antennae (smart antenna system of WLAN is composed of array antennas, and the array antennae are composed of a plurality of omni-directional antennas, see fig. 3, p.2, [0021]).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Hung with Chow for the benefit of increasing the number users in a WLAN system.

7. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Chow (6,771,996)** in view of **Stanley (6,836,467)**.

Regarding **claim 12**, as applied to claim 1, Chow discloses the claimed invention except wherein all wireless links have equal capacities.

In the same field of endeavor, Stanley discloses wherein all wireless links have equal capacity (radioports 22 of communication network 20 have equal channel capacity, see fig. 1, col. 9, lines 26-42 and col. 11, lines 36-45).

It would therefore have been obvious to one of ordinary skill in the art to combine the teaching of Stanley into the system of Chow for the benefit of determining a system architecture for radioports in a wireless communication system.

8. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Chow (6,771,996)** in view of well known prior art (**MPEP 2144.03**).

9. Regarding **claim 9**, as applied to claim 1, Chow discloses the claimed limitations, but fails to specifically disclose wherein each node is equipped with exactly one omni-directional antenna. However, the examiner takes Official Notice that it is well known to have a node that is equipped with exactly one omni-directional antenna.

As a note, one of ordinary skill in the art would recognize that the feature of a node that is equipped with exactly one omni-directional antenna is common knowledge. For example, a base station can have an omni-directional antenna radiates maximum power fully in all directions.

It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chow by incorporating an omni-directional antenna at all the node sites for the purpose of receiving signals equally in all directions.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Dean 6,542,746 discloses a frequency reuse scheme for point to multipoint radio communication.

Rha et al 5,365,571 discloses a cellular system having frequency plan and cell layout with reduced co-channel interference.

Tang et al 6,522,885 discloses a method and system for solving cellular communications frequency planning problem.

Garrison et al 6,643,277 discloses frequency re-use for point to multipoint applications.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olumide T. Ajibade-Akonai whose telephone number is 571-272-6496. The examiner can normally be reached on M-F, 8.30p-5p.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph H. Feild can be reached on 571-272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

OA

JOSEPH FEILD
SUPERVISORY PATENT EXAMINER